Washington State Department of Health

ELABORATIONS

News and Issues for Washington's Clinical Laboratories

Volume XI Issue 2 February 2006

Botulism – Home Canning Illness or BT Threat

by Liz Dykstra, DOH PHL

Botulism is a neuroparalytic illness caused by a neurotoxin produced by the bacterium *Clostridium botulinum*. Botulism was first seriously studied after an outbreak associated with consumption of blood sausage in Germany in 1793 in which thirteen people were affected, 6 of whom died. The number of reported cases of "sausage poisoning" increased at such a rate that Justinius Kerner, a local health officer, decided to study the disease. His 1829 findings described 230 cases, the majority of which were attributed to eating sausage. The illness became known as "botulism," derived from "botulus," the Latin word for sausage. The pathogenesis of botulism was described in 1897 by Emile van Ermengem after he investigated an outbreak in Belgium.

Today, botulinum toxin is used for a variety of therapeutic reasons, including "Botox," the popular anti-wrinkle remedy. Attendees at Botox parties have minute (1:40,000 dilution of Type A toxin) amounts of the toxin injected around wrinkle-prone facial areas in their attempts to appear younger. Botulinum toxin is also licensed for treatment of cervical torticollis, strabismus, and blepharospasm associated with dystonia. It is also used "off label" for a variety of more prevalent conditions that include migraine headache, chronic low back pain, stroke, traumatic brain injury, cerebral palsy, achalasia, and various dystonias.

With such a variety of uses, it may be suprising to know that botulinum toxin is the most poisonous substance known. A single gram of crystalline toxin, evenly dispersed and inhaled, could kill more than 1 million people. However, various technical factors make such dissemination very difficult. Botulinum toxin has been developed as a biological weapon and could be used as such because it can be inhaled or swallowed. (Terrorists have attempted to use therapeutic botulinum toxin as a bioweapon, but it is impractical since only a minute amount of toxin is present in a typical vial.)

After absorption into the bloodstream, the botulinum toxin binds irreversibly to the presynaptic nerve endings of the peripheral nervous system and cranial nerves. This inhibits the release of acetylcholine (necessary for stimulation of muscle fibers) which makes the muscle unable to contract, resulting in flaccid muscle paralysis.

Classic botulism paralysis is characterized by a symmetric, descending, flaccid paralysis of motor and autonomic nerves which usually begin with the cranial nerves. Other initial symptoms can include blurred vision, dysarthria and dysphagia. Diagnosis of botulism is based on compatible clinical findings, a history of exposure to suspect foods, and supportive ancillary testing to rule out other causes of neurologic dysfunction that mimic botulism such as stroke, Guillain-Barré syndrome and myasthenia gravis. Botulism cannot spread from person to person.

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Practice Guidelines

The following practice guidelines have been developed by the Clinical Laboratory Advisory Council. They can be accessed at the following website:
www.doh.wa.gov/lqa.htm

Anemia	Lipid Screening
ANA	PAP Smear
Bioterrorism Event Mgmt	Point-of-Care Testing
Bleeding Disorders	PSA
Chlamydia	Rash Illness
Diabetes	Red Cell Transfusion
Group A Strep Pharyngitis	Renal Disease
Group B Streptococcus	STD
Hepatitis	Thyroid
HIV	Tuberculosis
Infectious Diarrhea	Urinalysis
Intestinal Parasites	Wellness

Botulism, continued from page 1

Symptoms of botulism appear in a few hours to several days after exposure, depending on how much toxin the person was exposed to. Symptoms of foodborne botulism may begin as early as 2 hours or as long as 8 days after ingestion of the toxin. The incubation period of inhalational botulism is not well known, but symptoms in the 3 known human cases occurred approximately 72 hours after exposure to what was probably a small amount of aerosolized toxin.

The three main types of botulism are foodborne, infant, and wound botulism. Foodborne botulism occurs when a person eats food contaminated with the toxin-producing bacteria. Infant botulism occurs in infants less than 1 year old who get *C. botulinum* bacteria in their intestinal tract. A common source of the bacteria for infants is unpasteurized honey. Wound botulism occurs when wounds are infected with *C. botulinum*, such as when a wound is contaminated during an outdoor injury by contact with contaminated soil. The bacteria can only infect damaged skin. Wound botulism is often associated with black tar heroin injection.

Clostridium botulinum is a gram positive, obligate, spore-forming anaerobe whose natural habitat is soil. *C. botulinum* consists of four genetically diverse groups that would not otherwise be designated as a single species except for their common characteristic of producing botulinum toxin. Botulinum toxin exists in seven distinct antigenic types A through G which are defined by their absence of cross-neutralization (e.g., anti-A antitoxin does not neutralize toxin types B-G). Human botulism is primarily caused by the strains of *C. botulinum* that produce types A, B and E. The toxin is usually inactivated by heat (100°C for 10 minutes).

Outbreaks of foodborne botulism have occurred in almost all states, but most have occurred in the western states of California, Washington, Oregon, Colorado, and Alaska. The majority of these cases resulting from Type A toxin. The most commonly implicated foods in the United States are "low-acid" vegetables such as beans, peppers, carrots and corn. While botulism has historically been associated with home canned products, an increased number of cases have been documented from eating various nonpreserved foods in restaurants or delicatessens. In Canada and Alaska, most foodborne outbreaks have resulted from type E toxin associated with native Inuit and Eskimo foods. In a given year, the Washington Department of Health (DOH) receives 0 to 2 reports of foodborne and wound botulism, and 0 to 4 cases of infant botulism. Recent foodborne cases were associated with improperly home-canned asparagus, beets, corn, carrots, spinach, and salsa.

Any outbreak of botulism should alert health workers to the possibility of bioterrorism, but certain characteristics would suggest a deliberate release of botulinum toxin including:

1. An outbreak of a large number of cases of acute flaccid paralysis with prominent bulbar palsies.
2. An outbreak with an unusual botulinum toxin type (i.e., type C, D, F, or G, or type E toxin) not acquired from an aquatic food.
3. An outbreak with a common geographic factor among cases (e.g., airport, work location) but without a common dietary exposure (i.e. features suggestive of an aerosol attack).
4. Multiple simultaneous outbreaks with no common source.

If a botulism case or outbreak is suspected, the Local Health Jurisdiction should be contacted immediately. The LHJ will contact the DOH Communicable Disease Epidemiology to obtain pre-approval of all botulism testing. Your lab will instructed on sample collection and shipping. Because antitoxin is released from storage only with the approval of the CDC, immediate action is critical to provide correct and timely treatment to the victim(s) and bring the outbreak under control and save lives. Any foods or containers (even washed containers) suspected of being contaminated should be refrigerated and held under lock and key until retrieval by public health personnel.

Additional information about botulism can be found at the Washington DOH website at www.doh.wa.gov.

ELABORATIONS is a free monthly publication of the Washington State Department of Health (DOH) Public Health Laboratories (PHL) and Office of Laboratory Quality Assurance (LQA).

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NOTE: Letters to the editor may be published unless specified otherwise by the author.

Website addresses:
DOH home page: http://www.doh.wa.gov
LQA home page: http://www.doh.wa.gov/lqa.htm
PHL home page:
http://www.doh.wa.gov/EHSPHL/PHL/default.htm

Basic Blood Cell Morphology Training Class

DATE, TIME & LOCATION: March 8 **OR** 9, 2006 from 8:45 a.m to 4:00 p.m at the DOH Public Health Laboratories in Shoreline, WA.

COURSE OBJECTIVES: The lecture section of this one-day course will cover the following subjects: selected cases involving WBCs, RBCs, and/or platelet pathology; and examination of red and white cell morphology using Kodachrome slides. The laboratory section will include examination of actual case slides and examination of unknown specimens to test your abilities.

Tuition: $115.00 if registered on or before March 1, 2006, or $125.00 thereafter.

Basic Blood Cell Morphology Training Class Registration Form

Name:_____

Employer:_____

Employer Address:_____

City:_____ State: _____ Zip:_____

Work Phone:_____FAX:_____

E-mail:_____ Message Phone:_____

Class Date (check one): _____March 8 **OR** _____March 9

Shipping & Handling of Infectious Substances Training Class

DATE, TIME & LOCATION: March 24 **OR** June 29 **OR** July 12, 2006 from 8:00 a.m to 12:30 p.m at the DOH Public Health Laboratories in Shoreline, WA.

COURSE OBJECTIVES: Due to the changes in the hazardous shipping regulations, this workshop is being offered in order to update laboratory professionals. If your lab transports specimens or cultures via the US Postal Service, private vehicle (public health nurse), or overnight air (FED EX, Airborne Express), then you will want to attend this course. According to the Department of Transportation, employers must certify the training of their employees that ship hazardous materials.

Tuition: $95.00 if registered on or before deadline (1 week prior to course date), or $105.00 thereafter.

Shipping and Handling of Infectious Substances Training Course Registration Form

Name:_____

Employer:_____

Employer Address:_____

City:_____ State: _____ Zip:_____

Work Phone:_____FAX:_____

E-mail:_____ Message Phone:_____

Class Date (check one): _____March 24 **OR** _____June 29 **OR** _____July 12

HOW TO REGISTER: Complete the registration form and mail to the **Department of Health, Training Program, 1610 NE 150th Street, PO Box 550501, Shoreline, WA 98155-9701,** fax to **206-418-5445** or e-mail to **phl.training@doh.wa.gov** A registration form is available at our web site: **www.doh.wa.gov/ehsphl/phl/training/train.htm**. DO NOT SEND MONEY WITH YOUR REGISTRATION FORM.

Good Laboratory Practices for Waived Testing Sites

The Centers for Disease Control and Prevention (CDC) recently published a guidance document titled "Good Laboratory Practices for Waived Testing Sites."

The report can be accessed online at:
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5413a1.htm

Calendar of Events

PHL Training Classes:
(http://www.doh.wa.gov/ehsphl/phl/training/train.htm)

Basic Blood Cell Morphology
March 8 OR 9 Shoreline

Packaging & Shipping of Infectious Substances
March 24 Shoreline

WSSCLS/NWSSAMT Spring Meeting
April 20-22, 2006 Seattle

Northwest Medical Laboratory Symposium
October 18-21, 2006 Portland

13th Annual Clinical Laboratory Conference
November 2006 Seattle

Contact information for the events listed above can be found on page 2. The Calendar of Events is a list of upcoming conferences, deadlines, and other dates of interest to the clinical laboratory community. If you have events that you would like to have included, please mail them to ELABORATIONS at the address on page 2. Information must be received at least one month before the scheduled event. The editor reserves the right to make final decisions on inclusion.

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